Exam 2 Information

You are encouraged to double check this document to make sure that I didn't leave anything off.

- **Section 14.1**
  - Domain
  - Range for "nice" functions.
  - Sketch the domain of a two variable function in the $xy-$plane
  - Level curves(Countour curves)
  - Level Surfaces.
- **Section 14.3**
  - geometric interpretation of partial derivatives f_x, f_y.
  - computing partial derivatives.
  - partial derivative notation.
  - Higher order partial derivatives.
  - Clairaut's Theorem
- **Section 14.4**
  - tangent plane of a surface: $z = f(x, y)$
    - using partials to find the normal vector
    - normal line to the tangent plane
  - Differentials
    - total differential
    - Linearization formula
    - using differentials/Linearization to approximate a calculation.
    - using differentials to approximate total change when input values have small adjustments, i.e. dx, dy,... are small.
- **Section 14.5**
  - chain rule: case 1 and 2
  - related rate word problems
  - implicit differentiation using chain rule
- **Section 14.6**
  - gradient vector
  - directional derivatives
    - using an angle θ
    - using a vector(needs to be unit)
    - from one point to another point
    - direction of max change(min change)
    - maximum(minimum) value of a directional derivative
  - Tangent plane to a level surface. i.e. $F(x, y, z) = k$
    - using partials to find the normal vector
    - normal line to the tangent plane
- **Section 14.7**
  - local max/local min
    - location versus value
  - finding critical points.
  - second derivative test to classify critical points.
  - doing algebra correctly
  - Max/min word problems.
  - Absolute maximum and absolute minimum.
    - location versus value
  - Method to find an absolute max/min on a closed and bounded region.
- **Section 14.8**
  - Legrange Multipliers
  - how to use them to solve max/min word problems.

Any additional topic/information covered in these sections.